PECAN STREET

2018 DOE Vehicle Technologies Office Annual Merit Review

Technology Integration
Electric Last Mile Project

Principal Investigator: Bert Haskell
Pecan Street, Inc.

Tuesday, June 19, 2018
Project ID: TI087

METRO

Overview

Timeline
- Start Date: 10/1/2017
- End Date: 3/31/2019
- Percent Complete: 35%

Barriers
- Lack of Customer Adoption
- Safety
- Unforeseen Regulatory Barriers

Budget
- Total Project Funding: $2M
  - DOE Share: $1M
  - Recipient Share: $1M
- Funding Received FY 2017:
- Funding for FY 2018:

Partners / Collaborators
- Project Lead: Pecan Street Inc.
- Capital Metropolitan Transportation Authority
- Electric Cab of North America
- Austin Transportation Department
- 2 Real Estate Developers
- 1 Neighborhood Association

Project Objectives

Objectives

- Increase transit ridership
- Reduce emissions & traffic congestion
- Prove value of public-private partnerships
- Evaluate technology solutions to transit problems

Supported TI Goals

- National Security (fuel diversity, domestic fuel sources)
- Economic Growth (improved mobility & productivity)
- Affordability (increased efficiency, reduced transportation costs)
- Reliability/Resiliency (diverse fueling & transportation options)

Impact

- Increase transit ridership in pilot neighborhoods from 4.2% to 8.4%
- Improve mobility & reduce congestion
- Create replicable model of public-private transportation partnerships

Project Approach

Budget Period 1

- 1.1: Customer Engagement & Route Planning
- 1.2: Installation & Operation of Data Collection Systems
- 1.3: Mobile / Web App Improvement & Integration
- 1.4: Pilot Electric Shuttle Service
- 1.5: Data Collection & Analysis

Budget Period 2

- 2.1: Continue Piloting Electric Bus Service
- 2.2: Continue Data Collection & Analysis
- 2.3: Autonomous Vehicle Technology Demonstration
- 2.4: Documentation of Program

Milestones – Budget Period 1

Date	Milestone	Type	Description
6/30/18	Mobile apps integrated	Technical	A mobile trip planning app integrating ELM service with the public transit agency's routes will be available for use
9/30/18	Initial ELM report completed	Technical	Report will include summary of initial telemetry data as well as customer demographic report, adoption rate report and initial impact assessment. Program issues, customer feedback and corrective measures will be highlighted.
9/30/18	Integration of ELM payment process with mobile app completed	Technical	Integration of ELM payment with the public transportation authority app will be complete and fee trials and payment processes will be available for use.
9/30/18	Data collection systems integrated and installed in vehicles and passing acceptance protocols	Go/No-Go	Design documentation, acceptance test plans and six installed data collections systems with associated backhaul communications completed. Better than 90% data collection system reporting.

Milestones – Budget Period 2

Date	Milestone	Type	Description
12/31/18	Autonomous vehicle demonstrations completed	Technical	An autonomous vehicle demonstration will be completed and documented
3/31/19	Data collection & ridership	Technical	8.4% ridership levels and 98% vehicle uptime achieved. Lessons learned and best practices, data available for community replication efforts available on Dataport.

Project Accomplishments & Progress

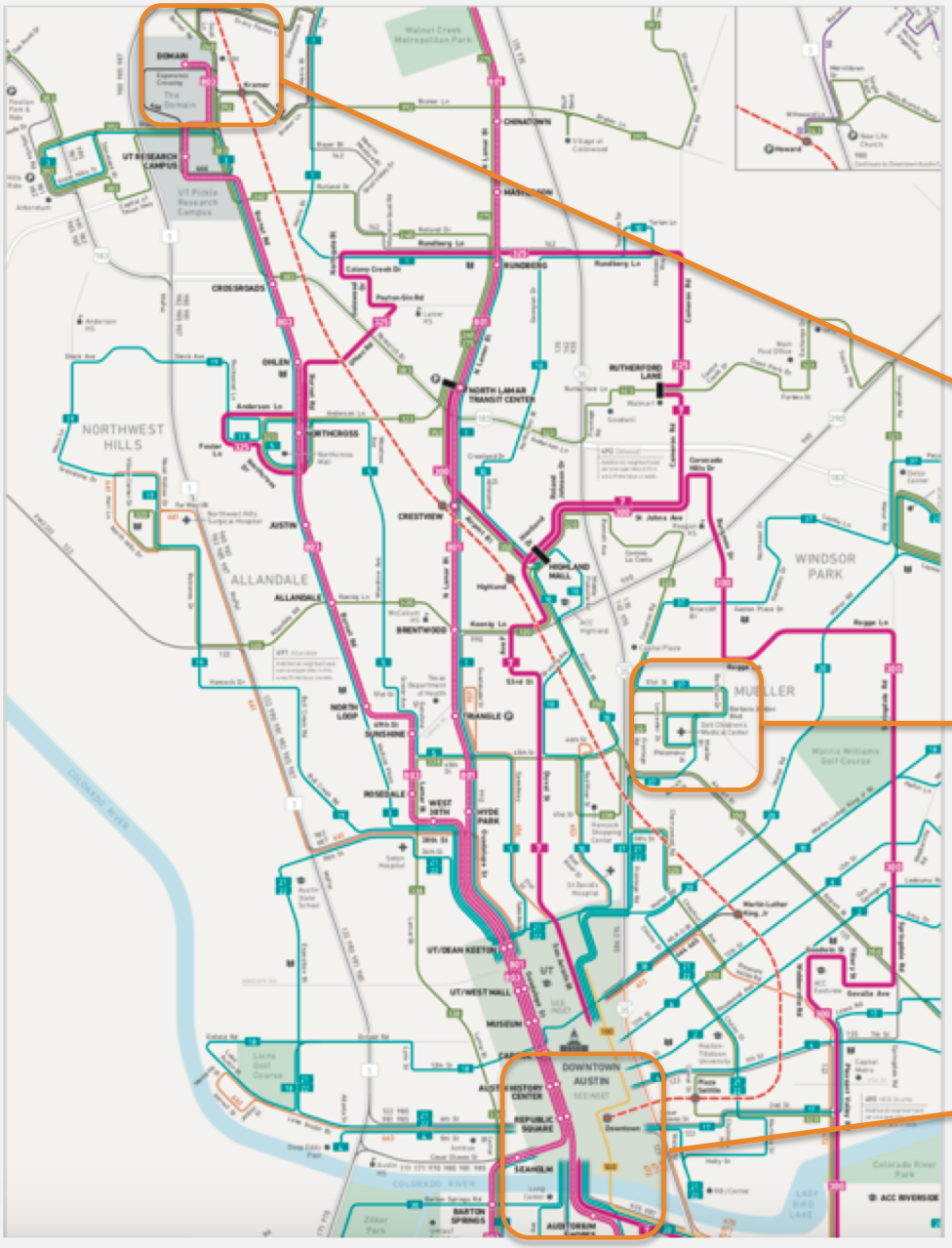
Collaboration

- Created first-of-its-kind public-private transportation consortium
- Solicited input from community stakeholders & industry leaders
- Designed routes to best connect dense mixed-use areas to public transportation hubs

Awareness

- Appeared on local TV promoting public transportation connections
- Promoted service at neighborhood association meetings, community sustainability events

Cap Metro Service - eShuttle Service Areas – Austin, TX

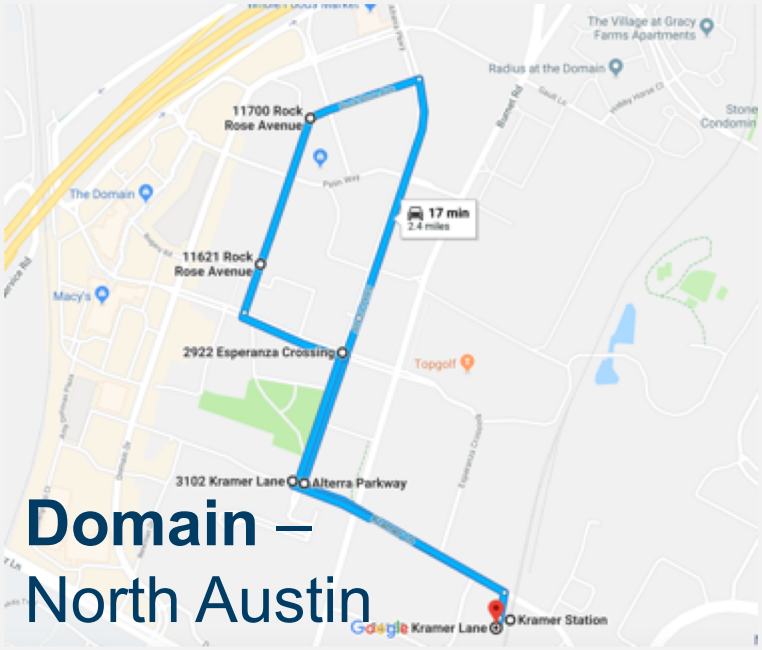


Domain Neighborhood

Mueller Neighborhood

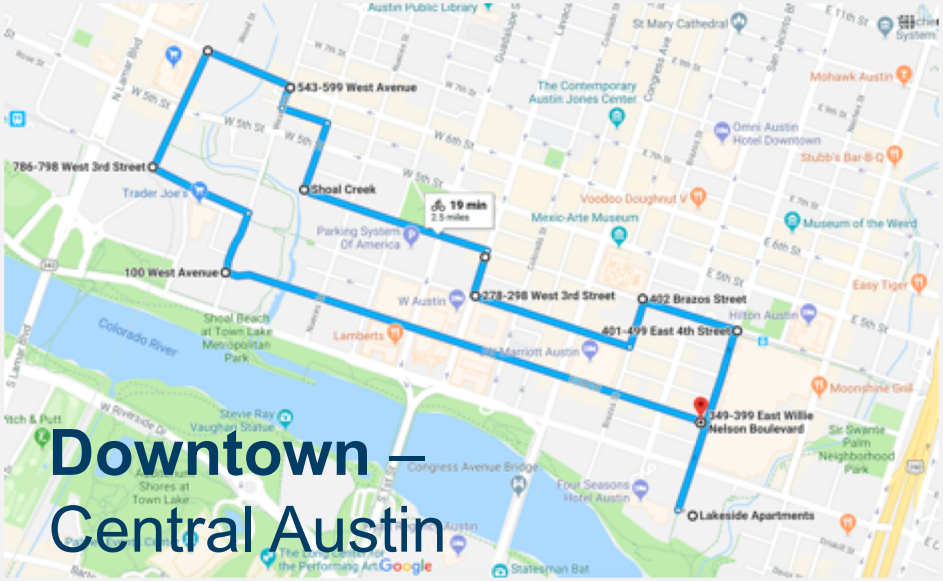
Downtown Neighborhood

eShuttle Routes



Domain –
North Austin

Mueller –
Central-east
Austin

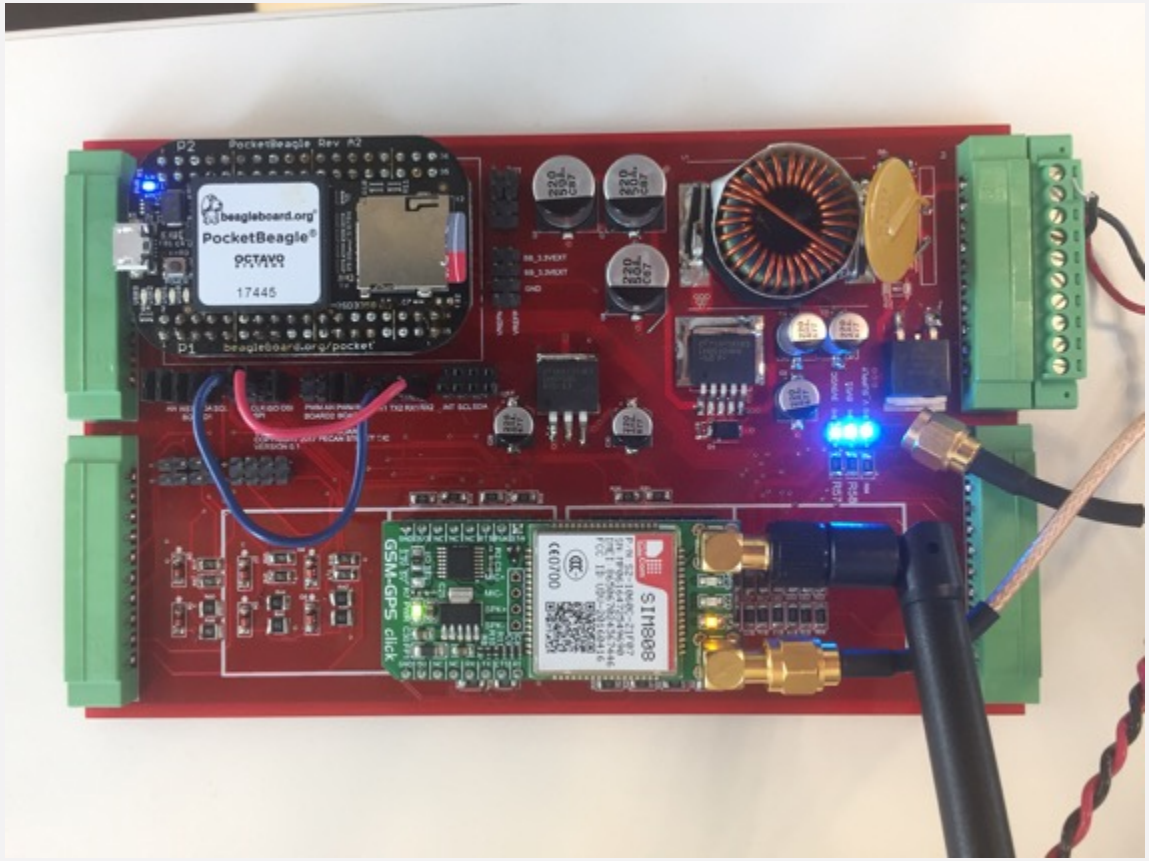


Downtown –
Central Austin

Project Accomplishments & Progress

Hardware

- Custom-designed and built vehicle telematics kit
- Collects 3-second level GPS and occupancy data

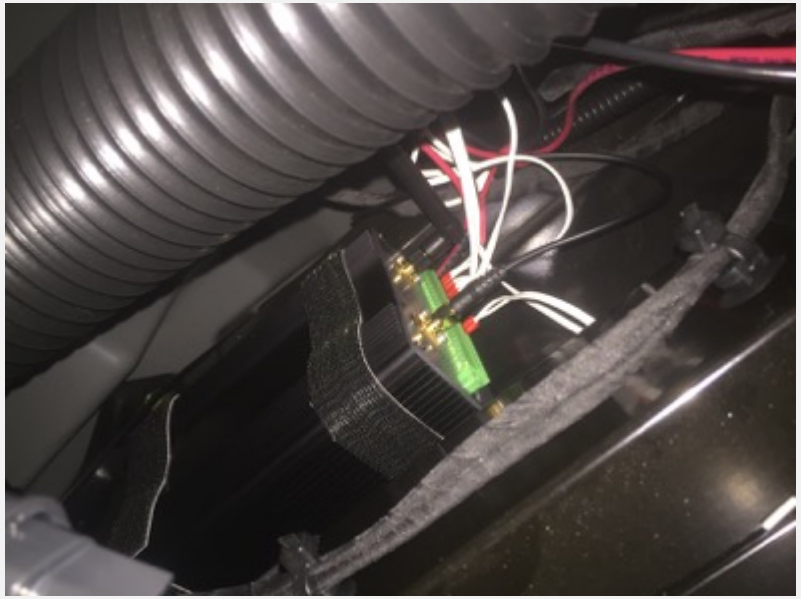


Project Accomplishments & Progress

Telematics Kit Installation

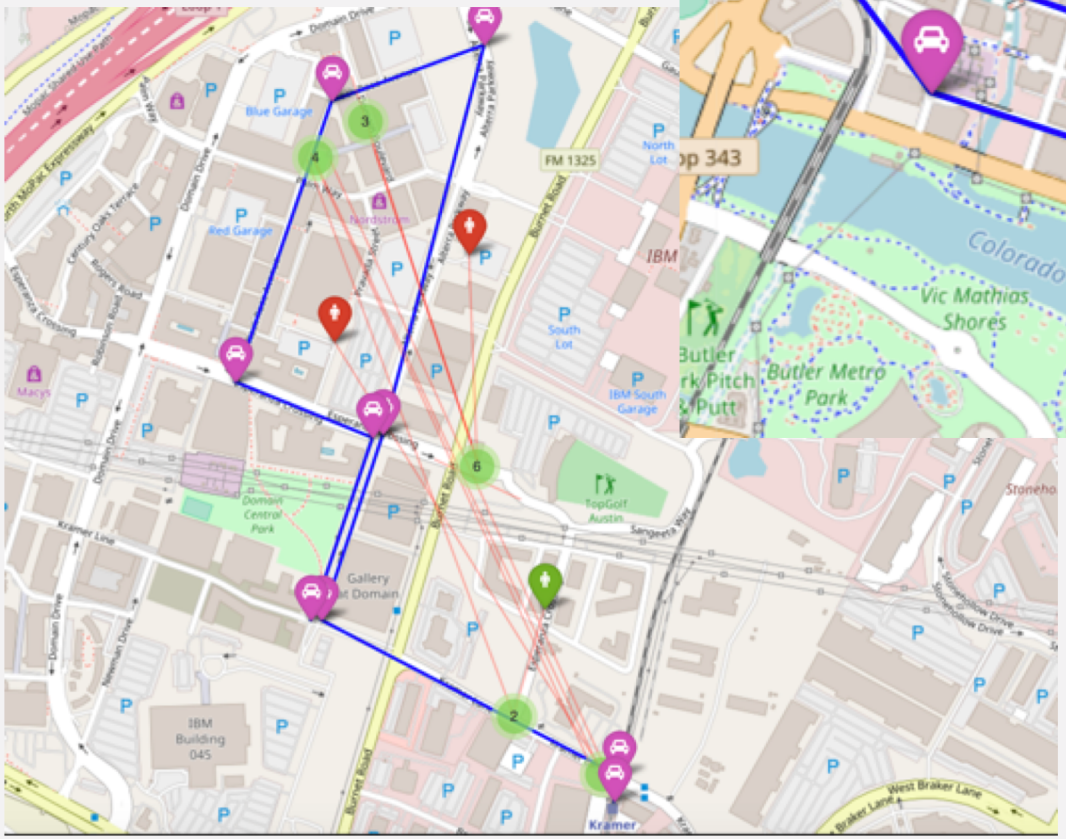
Seatbelt Sensors

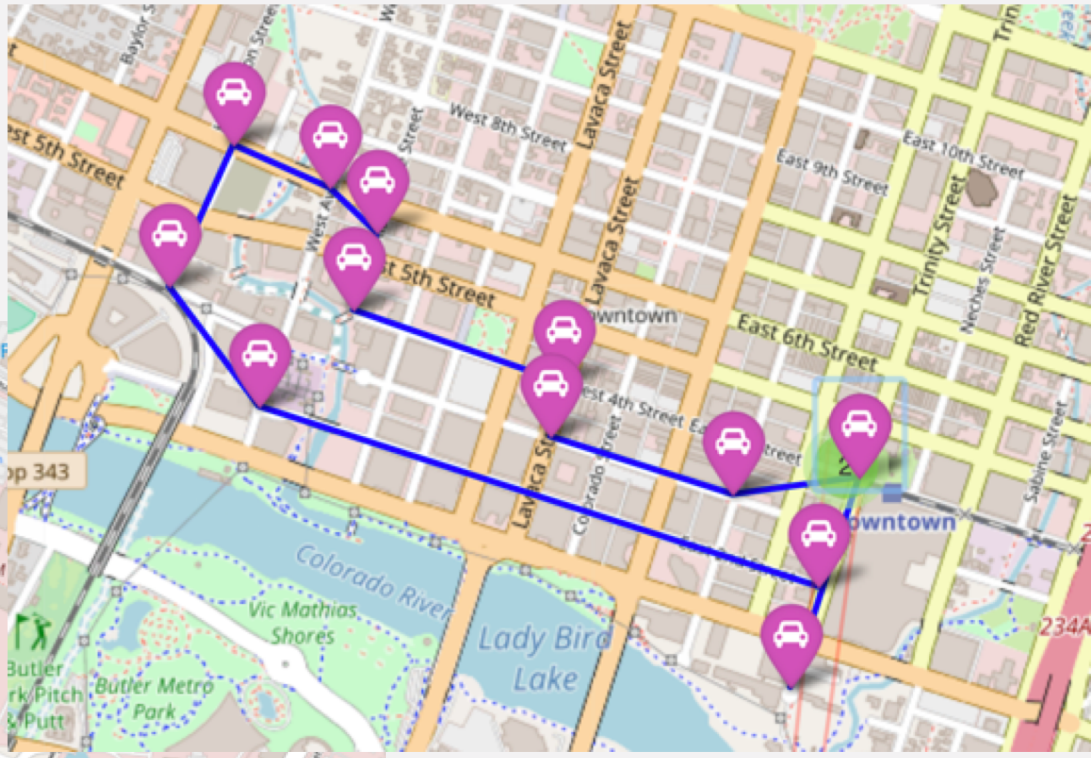
Installed Telematics Kit



Project Accomplishments & Progress

Snapshot of Domain Riders





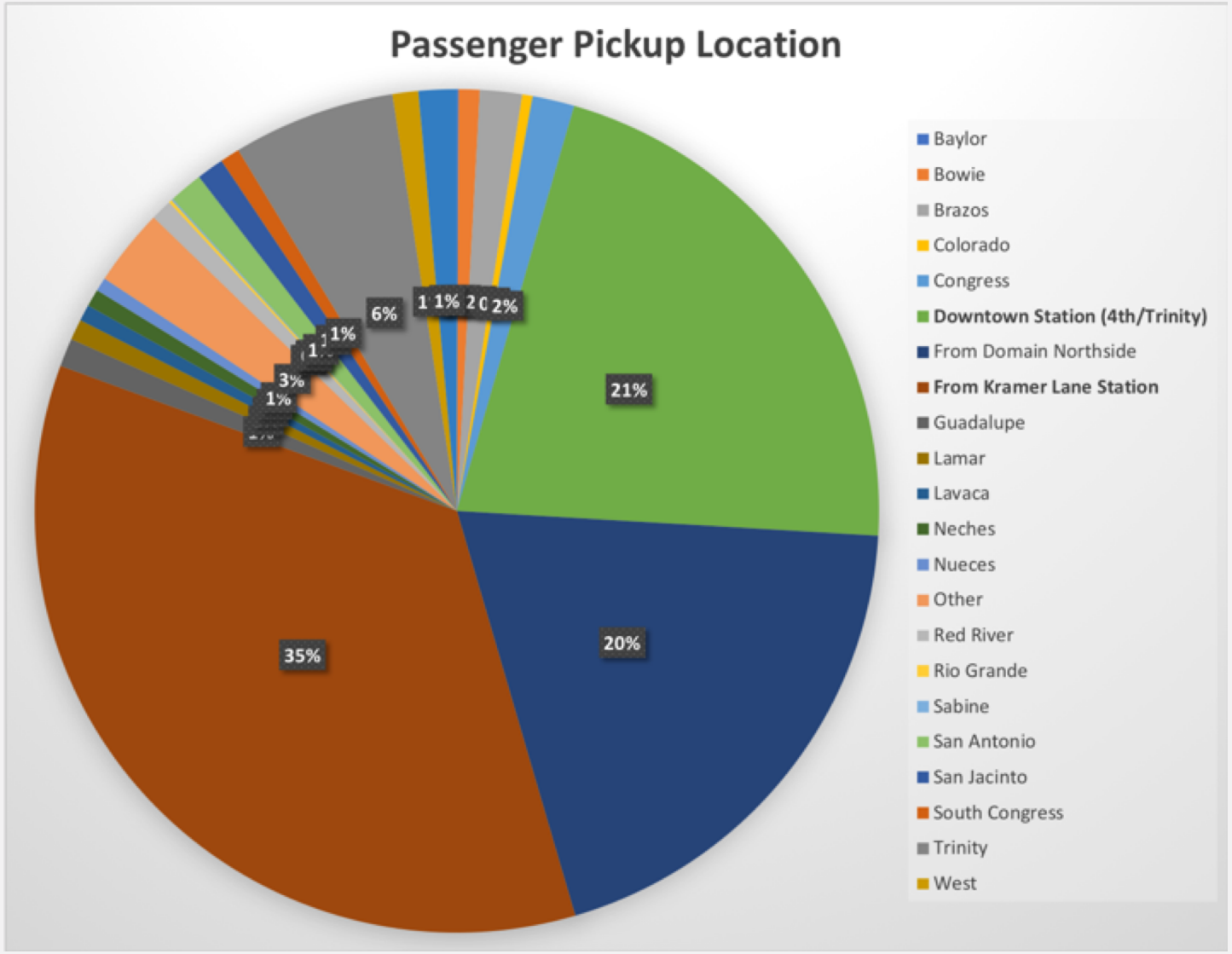
Snapshot of Downtown Riders

Project Accomplishments & Progress

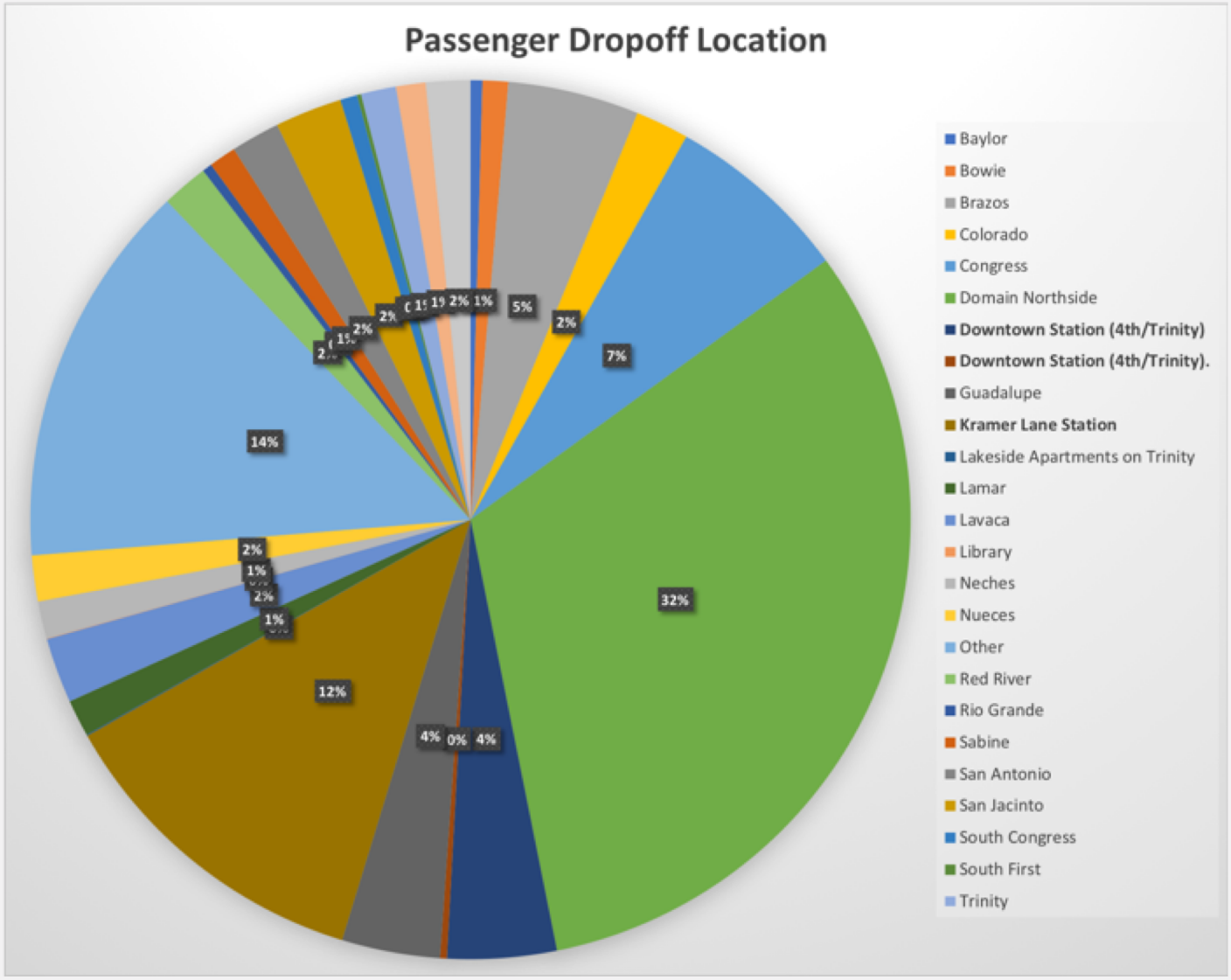
Ridership (as of 3/31/18)

- 4792 rides since 11/24/17
- 2711 rides connecting from Cap Metro train stations (56%)
- 784 rides connecting to Cap Metro train stations (46%)

Project Accomplishments & Progress



Project Accomplishments & Progress



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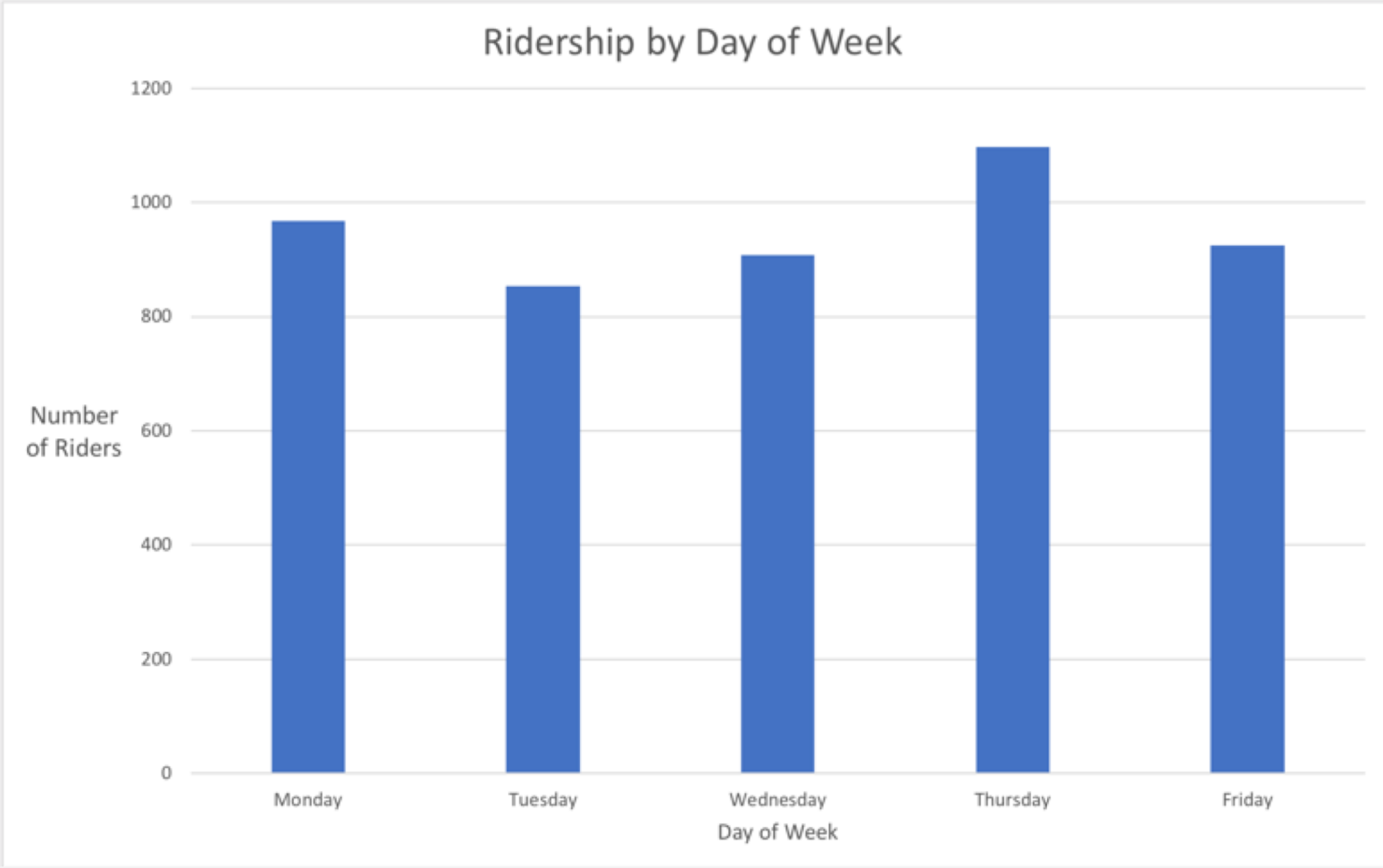

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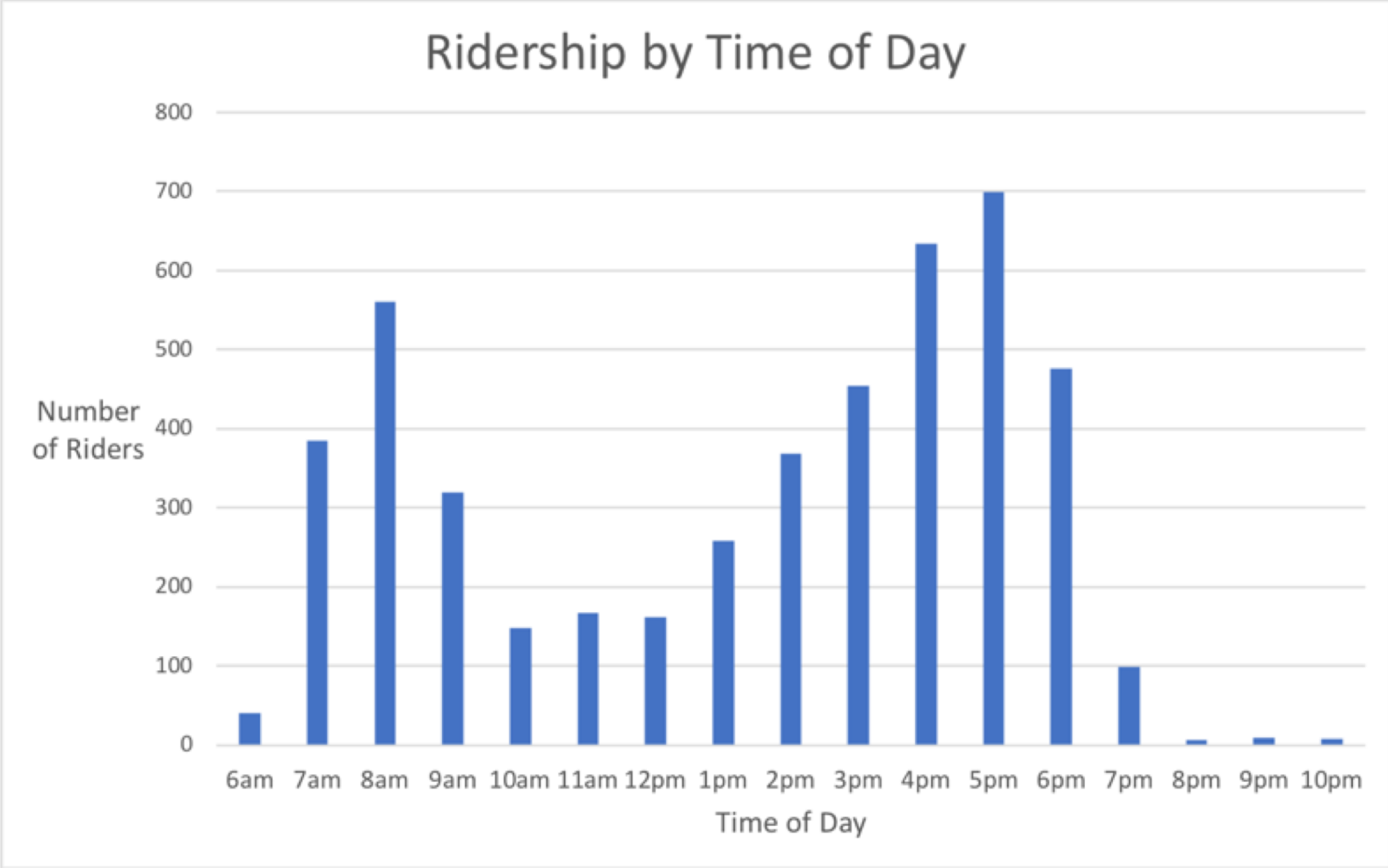

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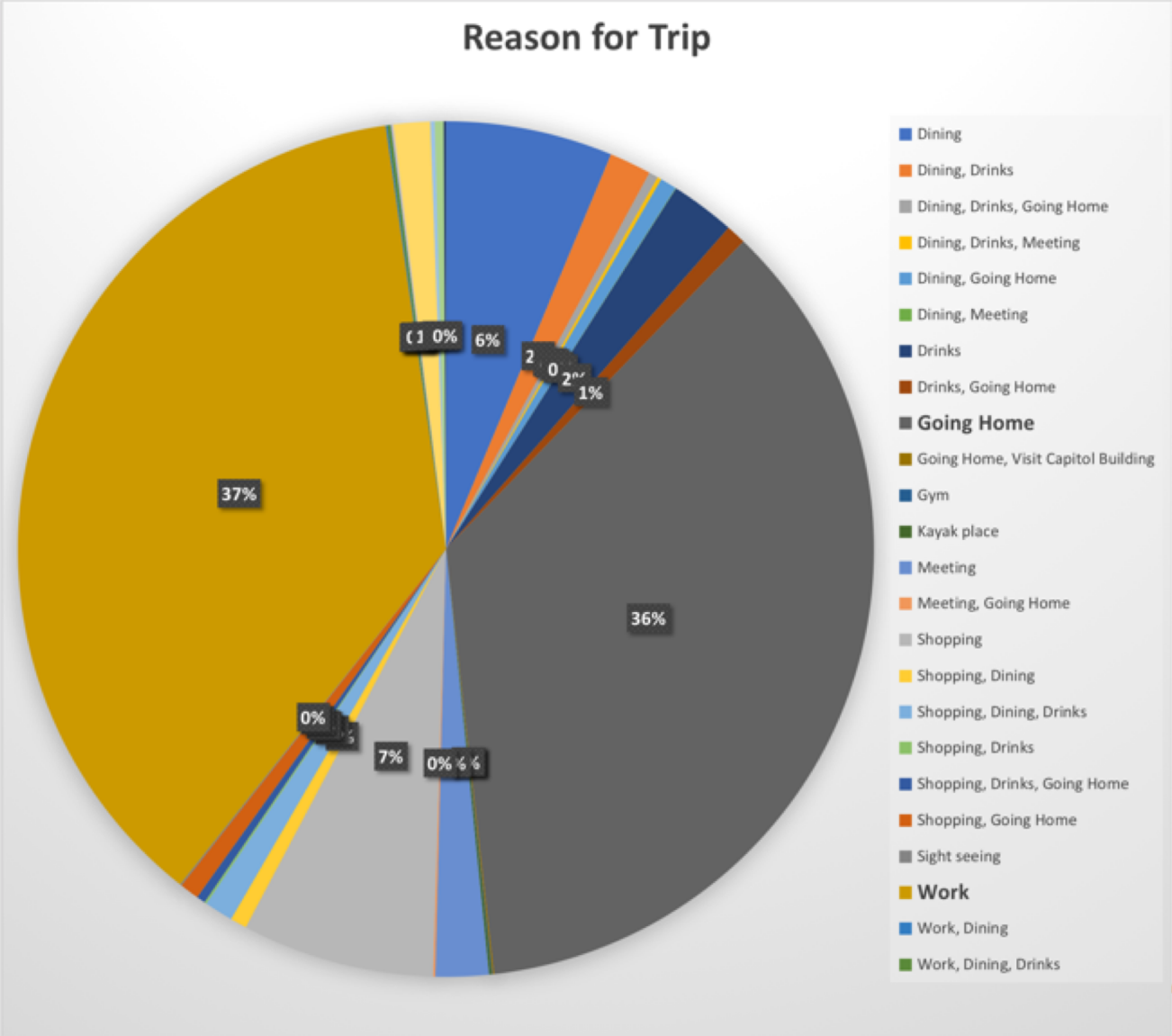

Collaboration & Coordination Among Project Team

Project Partners	PECAN STREET, METRO
Microtransit Vendor	eCAB
Project Supporters	CITY OF AUSTIN FOUNDED 1839, AUSTIN ENERGY®

Overall Impact

Mobility	Improved mobility options in 2 Austin neighborhoods, making transportation safer and easier
Data	Collected data on transportation patterns and passenger behavior
Technology	Created custom telematics kit to collect real-time granular data on occupancy, location, and speed
Innovation	Combines app and phone-based trip request capability with circulator model for flexibility and responsiveness
Collaboration	Created foundation for replicable public-private partnership transportation models

Overall Impact – Moving Forward

Technology	Will demonstrate and collect data on autonomous vehicle technology, including operations and consumer response
Data	Will collect data on traffic and emissions reductions achieved through all-electric shuttles
Replicability	Will compile lessons learned and best-practices to enable other communities to try similar transportation solutions
Community	Will determine public response to the service and impacts to neighborhood livability and lifestyle
Feasibility	Will test pricing models to understand the value provided to consumers
Sustainability	Seeking business sponsorships to create a service sustainable without government funding

Summary

Goals

- Improve mobility and reduce congestion and emissions through low-speed electric circulators
- Utilize innovative on-demand trip request technology combined with flex routes
- Demonstrate technology solutions to transportation problems including electric / autonomous vehicles and data collection modules
- Prove value of public-private partnerships to overcome local challenges
- Make data available to for analysis and replication